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BASIC ENVIRONMENTAL TESTING PROCEDURES FOR ELECTRONIC AND ELECTRICAL ITEMS

PART XX RESISTANCE TO CLEANING SOLVENTS AND PERMANENCE OF MARKINGS

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BASIC ENVIRONMENTAL TESTING PROCEDURES FOR ELECTRONIC AND ELECTRICAL ITEMS

PART XX RESISTANCE TO CLEANING SOLVENTS AND PERMANENCE OF MARKINGS

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BASIC ENVIRONMENTAL TESTING PROCEDURES FOR ELECTRONIC AND ELECTRICAL ITEMS

PART XX RESISTANCE TO CLEANING SOLVENTS AND PERMANENCE OF MARKINGS

0. FOREWORD

0.1 This Indian Standard (Part XX) was adopted by the Indian Standards Institution on 20 August 1979, after the draft finalized by the Environmental Testing Procedures Sectional Committee had been approved by the Electronics and Telecommunication Division Council.

0.2 This standard is intended to determine the resistance of electronic and electrical items and their markings to cleaning solvents. This test is particularly important for components or parts mounted on printed circuit boards.

0.3 This standard comprises a test procedure whereby electronic and electrical items to be tested are immersed in a certain solvent at a specified temperature and for a specified time.

0.3.1 If required by the relevant specification, after immersion and drying, the items shall be rubbed with cotton wool or wrapping tissue paper.

0.4 This standard shall be read in conjunction with IS : 9001 (Part V)-1979*.

0.5 This standard is largely based on IEC Document 50C (Central Office) 19 'Draft Test XA : Immersion in Cleaning Solvents, and Guide to Test XA', issued by the International Electrotechnical Commission.

0.6 In reporting the result of a test or analysis, made in accordance with this standard, if the final value, observed or calculated, is to be rounded off, it shall be done in accordance with IS : 2-1960†.

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*Guidance for environmental testing: Part V Resistance to cleaning solvents and permanence of markings.

†Rules for rounding off numerical values (*revised*).

1. SCOPE

1.1 This standard (Part XX) deals with the procedure for assessing resistance of electronic and electrical items and permanence of their markings to cleaning solvents, as a part of basic environmental testing procedures.

2. OBJECT

2.1 The object of this test is to determine the deleterious effects caused on items when contaminated with solvents (normally used to clean solder flux, finger prints and other contaminants from printed wiring and terminal board assemblies) and to verify that the markings or colour codings remain legible and without discolouration.

3. TEST EQUIPMENT

3.1 A suitable container made of inert material and of a sufficient size to permit complete immersion of the items in the solvent solutions (*see* **4**) shall be used.

3.2 **Brush** — A suitable brush (for example, tooth brush) with a handle made of nonreactive material shall be used. The brush shall have three long rows of hard bristles, the free ends of which shall lie substantially in the same horizontal plane. A separate brush shall be used for each test.

3.3 **Cotton Wool** — Commercially available types, for example, as applied for medical purposes, may be used.

3.4 **Wrapping Tissue Paper** — Wrapping tissue paper as specified in IS : 4661-1968* may be used.

4. TEST SOLVENTS

4.0 The following two types of solvents are specified for the purpose of this test.

4.1 **Solvent 1** — a mixture of 1,1,2-trichlorotrifluorethane, 70 ± 5 percent by mass, and propan-2-ol, 30 ± 5 percent by mass. It shall be of commercially available grades for industrial use.

> NOTE — Use of any other solvents, such as trichloroethylene or a mixture of isopropyl alcohol (one part) and mineral spirits (three parts) shall be subject to agreement between the manufacturer and the supplier.

4.2 **Solvent 2**—demineralized or distilled water. Water used shall have a resistivity of not less than 500 Ωm.

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*Glossary of terms used in paper trade and industry.

5. SEVERITIES

5.1 The following severities are specified for the purpose of the test:

a) *Solvent Temperature*

  1) Solvent at ambient temperature, that is, 25 ± 5°C (applicable to Solvent 1).

  2) Solvent at boiling temperature, 48·6 to 50·5°C (applicable to Solvent 1).

  3) Solvent at 55 ± 5°C (applicable to Solvent 2).

b) *Duration of Immersion* — 5 ± 0·5 minutes in every case.

6. INITIAL MEASUREMENTS

6.1 If the test is made to determine the superficial effects on marking, encapsulation, coating, etc, the item shall be visually inspected.

6.2 If the test is made to determine the effects on the characteristics of the item, the relevant specification may also require electrical and/or mechanical measurements.

7. CONDITIONING

7.1 Method 1 : Superficial Effects on Marking, Encapsulation Coating, Etc — The item shall be completely immersed in one of the solvents (*see* **4**) maintained at specified temperature [*see* **5.1**(a)] and for the time as specified in **5.1**(b). After removal of the item from the solvent the item shall be allowed to dry for at least 5 minutes. Then the marking area shall be rubbed with brush or cotton wool or with wrapping tissue paper to determine the durability of the marking. Ten strokes, 2 × 5 in 2 opposite directions, shall be applied over the marking area with a force of approximately 5 N. New cotton wool or wrapping tissue paper shall be used for each item to be tested.

7.1.1 *Application of Different Test Conditions or Methods to the Same Type of Component* — When a type of component or part is to be tested under different test conditions or methods, separate items should be used for each test.

7.2 Method 2 : Effects on the Characteristics of the Item — The item shall be completely immersed in one of the solvents (*see* **4**) at one of the temperatures given in **5.1**(a) and for the time given in **5.1**(b).

8. RECOVERY

8.1 If final electrical and/or mechanical measurements are required, the item shall remain under standard atmospheric conditions for testing for not less than 1 hour and not more than 2 hours.

9. FINAL MEASUREMENTS

9.1 If the test is made to determine the superficial effects on marking, encapsulation, coating, etc, the item shall be visually inspected.

9.2 If the test is made to determine the effects on the characteristics of the item, the relevant specification may also require electrical and/or mechanical measurements.

10. INFORMATION TO BE GIVEN IN THE RELEVANT SPECIFICATION

10.1 When this test is included in the relevant specification, the following details shall be given as far as they are applicable:

a) Solvent to be used (*see* **4**);
b) Solvent temperature [*see* **5.1**(a)];
c) Initial measurements, if any (*see* **6**);
d) Conditioning, Method 1 or Method 2 (*see* **7**);
e) Final measurements (*see* **9**); and
f) Acceptance criteria:
    1) For superficial effects,
    2) For electrical and/or mechanical parameters.

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